REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Changes in accordance with N.O.R. 5962-R145-93.	93-05-25	M. A. FRYE
B	Changes in accordance with N.O.R. 5962-R234-93.	93-10-15	M. A. FRYE
C	Add case outline X, which is a 10-lead flat pack. Make changes to 1.3, 3.2.1, 3.2.2, and figure 1. Also, make changes to CMRR, +VO, -VO, GFPL, GFPH, GFR, SSBW, HD2, HD3, and VN tests as specified in table I herein. Redrawn. - ro	99-02-10	R. MONNIN
D	Make change to input offset current test as specified under table I. Delete figure 1. - ro	00-04-14	R. MONNIN
E	Add radiation hardened requirements. - ro	00-06-30	R. MONNIN
F	Make correction to input referred noise voltage test unit as specified in table I. - ro	01-06-14	R. MONNIN

THE ORIGINAL FIRST SHEET OF THIS DOCUMENT HAS BEEN REPLACED.

REV																				
SHEET																				
REV	E																			
SHEET	15																			

REV STATUS	REV	E	E	E	E	E	E	E	E	E	E	E	E	E	E
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

PMIC N/A

PREPARED BY
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STANDARD MICROCIRCUIT DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

CHECKED BY
CHARLES E. BESORE

APPROVED BY
MICHAEL A. FRYE

DRAWING APPROVAL DATE
92-08-06

MICROCIRCUIT, LINEAR, HIGH SPEED, VOLTAGE, FEEDBACK OPERATIONAL AMPLIFIER, MONOLITHIC SILICON

REVISION LEVEL	SIZE	CAGE CODE	
E	A	**67268**	**5962-91758**

SHEET 1 OF 15

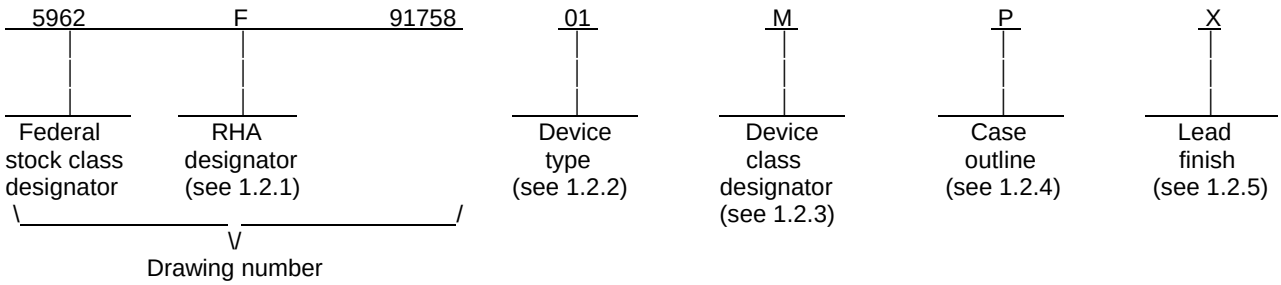
DSCC FORM 2233
APR 97

5962-E458-01

1. SCOPE

1.1 Scope. This drawing documents two product assurance class levels consisting of high reliability (device classes Q and M) and space application (device class V). A choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of Radiation Hardness Assurance (RHA) levels are reflected in the PIN.

1.2 PIN. The PIN is as shown in the following example:



1.2.1 RHA designator. Device classes Q and V RHA marked devices meet the MIL-PRF-38535 specified RHA levels and are marked with the appropriate RHA designator. Device class M RHA marked devices meet the MIL-PRF-38535, appendix A specified RHA levels and are marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) identify the circuit function as follows:

Device type	Generic number	Circuit function
01	CLC420A	High speed, voltage feedback operational amplifier
02	CLC420B	High speed, voltage feedback operational amplifier

1.2.3 Device class designator. The device class designator is a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
M	Vendor self-certification to the requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A
Q or V	Certification and qualification to MIL-PRF-38535

1.2.4 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
P	GDIP1-T8 or CDIP2-T8	8	Dual-in-line
X	GDFP1-G10	10	Flat pack with gull wing leads
2	CQCC1-N20	20	Square leadless chip carrier

1.2.5 Lead finish. The lead finish is as specified in MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

1.3 Absolute maximum ratings. 1/

Supply voltage (V±) ..... ±7 V dc
Output current (I_{OUT}) ..... 70 mA
Common mode input voltage (V_{CM}) ..... V±
Differential input voltage ..... 10 V
Power dissipation (P_D) ..... 112 mW
Junction temperature (T_J) ..... +175°C
Storage temperature range ..... -65°C to +150°C
Lead temperature (soldering, 10 seconds) ..... +300°C
Thermal resistance, junction-to-case (θ_{JC}):
Case P ..... 23°C/W
Case X ..... 24°C/W
Case 2 ..... 25°C/W
Thermal resistance, junction-to-ambient (θ_{JA}):
Case P ..... 125°C/W still air
72°C/W at 500 linear feet per minute (LFPM)
Case X ..... 205°C/W still air
125°C/W at 500 linear feet per minute (LFPM)
Case 2 ..... 100°C/W still air
68°C/W at 500 linear feet per minute (LFPM)

1.4 Recommended operating conditions.

Supply voltage (V±) ..... ±5 V dc
Gain range (A_V) ..... ±1 to ±10
Ambient operating temperature (T_A) ..... -55°C to +125°C

1.5 Radiation features.

Maximum total dose available (dose rate = 50 to 300 rads (Si)/s) ..... 300 Krads 2/

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.
2/ These parts may be dose rate sensitive in a space environment and demonstrate enhanced low dose rate effect. Radiation end point limits for the noted parameters are guaranteed only for the conditions as specified in MIL-STD-883, method 1019, condition A.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard Microcircuits.
MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-103 - List of Standard Microcircuit Drawings.
MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements for device classes Q and V shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. The individual item requirements for device class M shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein for device classes Q and V or MIL-PRF-38535, appendix A and herein for device class M.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Radiation exposure circuit. The radiation exposure circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing and acquiring activity upon request.

3.3 Electrical performance characteristics and post irradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and post irradiation parameter limits are as specified in table I and shall apply over the full ambient operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are defined in table I.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103. For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device. For RHA product using this option, the RHA designator shall still be marked. Marking for device classes Q and V shall be in accordance with MIL-PRF-38535. Marking for device class M shall be in accordance with MIL-PRF-38535, appendix A.

3.5.1 Certification/compliance mark. The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-PRF-38535. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, appendix A.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ 2/ 3/ $-55°C \le T_A \le +125°C$ unless otherwise specified		Group A subgroups	Device type	Limits 4/		Unit
						Min	Max	
Open loop characteristics								
Input bias current (noninverting)	$+I_{IN}$			1,2	All	-10	+10	µA
				3		-20	+20	
			M,D,P,L,R,F	1		-10	+10	
Input bias current (inverting)	$-I_{IN}$			1,2	All	-10	+10	µA
				3		-20	+20	
			M,D,P,L,R,F	1		-10	+10	
Input offset voltage	V_{IO}			1	01	-2.0	+2.0	mV
				2		-3.5	+3.5	
				3		-3.2	+3.2	
			M,D,P,L,R,F	1		-2.0	+2.0	
				1	02	-0.8	+0.8	
				2		-1.8	+1.8	
				3		-1.6	+1.6	
			M,D,P,L,R,F	1		-0.8	+0.8	
Average +input bias current drift	T_C ($+I_{IN}$)	5/ 6/		2	All		60	nA/°C
				3			120	
Average -input bias current drift	T_C ($-I_{IN}$)	5/ 6/		2	All		60	nA/°C
				3			120	
Average input offset voltage drift	T_C (V_{IO})	5/ 6/		2,3	01		15	µV/°C
					02		10	
Input offset current	I_{IO}			1	All		1.0	µA
				2			2.0	
				3			3.0	
			M,D,P,L,R,F	1			1.0	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 4/		Unit
					Min	Max	
Open loop characteristics – continued.							
Average input offset current drift	T_C (I_{IO})	5/ 6/	2	All		10	nA/°C
			3			20	
Open loop gain	A_{OL}		1,2	All	56		dB
			3		52		
		M,D,P,L,R,F	1		56		
Quiescent supply current (no load)	I_{CC}		1,2,3	All		5.0	mA
		M,D,P,L,R,F	1			5.0	
Power supply rejection ratio	PSRR	V+ = +4.5 V to +5.0 V V- = -4.5 V to –5.5 V	1,2	All	60		dB
			3		55		
		M,D,P,L,R,F	1		60		
Common mode rejection ratio	CMRR	V_{CM} = ±1 V	1,2	All	65		dB
			3		60		
		M,D,P,L,R,F	1		65		
Differential mode input resistance	R_{IND}	5/ 6/	4,5	All	1		MΩ
			6		0.5		
Differential mode input capacitance	C_{IND}	5/ 6/	4,5,6	All		2	pF
Common mode input resistance	R_{INC}	5/ 6/	4,5	All	0.5		MΩ
			6		0.25		
Common mode input capacitance	C_{INC}	5/ 6/	4,5,6	All		2	pF

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ 2/ 3/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 4/ Min	Limits 4/ Max	Unit
Open loop characteristics - continued							
Common mode input voltage	$+V_{CM}$	5/ 6/	4,5	All	+2.8		V
			6		+2.5		
	$-V_{CM}$		4,5			-2.8	
			6			-2.5	
Output current	$+I_{OUT}$	5/ 6/	4,5	All	+50		mA
			6		+30		
	$-I_{OUT}$		4,5			-50	
			6			-30	
Output impedance	R_{OUT}	At dc 5/ 6/	4,5	All		0.2	Ω
			6			0.3	
Output voltage swing	$+V_O$	No load 5/ 6/	1,2	All	+3		V
			3		+2.8		
		R_L = 100 Ω	1,2,3		+2.5		
		M,D,P,L,R,F	1		+2.5		
	$-V_O$	No load 5/ 6/	1,2			-3	
			3			-2.8	
		R_L = 100 Ω	1,2			-2.5	
			3			-2.2	
		M,D,P,L,R,F	1			-2.5	
Frequency domain response							
Gain flatness peaking low	GFPL	At 0.1 MHz to 100 MHz, 5/ $V_{OUT} < 0.4\ V_{PP}$	4	All		1.4	dB
			5 7/			1.6	
			6 7/			1.4	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ 2/ 3/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 4/		Unit
					Min	Max	
Frequency domain response – continued.							
Gain flatness peaking high	GFPH	At > 100 MHz, 5/	4	All		3.0	dB
		$V_{OUT} < 0.4\ V_{PP}$	5 7/			3.0	
			6 7/			5.0	
Gain flatness rolloff	GFR	At 0.1 MHz to 5/ 6/ 100 MHz,	4,6	All		1.0	dB
		$V_{OUT} < 0.4\ V_{PP}$	5			2.0	
		At 0.1 MHz to 30 MHz, 5/	4			1.4	
		$A_V = -1$, $R_F = 500\ \Omega$,	5 7/			1.6	
		$V_{OUT} < 0.4\ V_{PP}$	6 7/			1.4	
Small signal bandwidth	SSBW	-3 dB bandwidth 5/ 6/	4,6	All	200		MHz
		$V_{OUT} < 0.4\ V_{PP}$	5		130		
		-3 dB bandwidth, 5/	4		65		
		$A_V = -1$, $R_F = 500\ \Omega$,	5 7/		45		
		$V_{OUT} < 0.4\ V_{PP}$	6 7/		65		
Large signal bandwidth	LSBW	-3 dB bandwidth 5/ 6/	4	All	25		MHz
		$V_{OUT} < 5\ V_{PP}$	5,6		20		
		-3 dB bandwidth, 5/ 6/	4		35		
		$A_V = -1$, $R_F = 500\ \Omega$, $V_{OUT} < 5\ V_{PP}$	5,6		30		
Linear phase deviation	LPD	At 0.1 MHz to 5/ 6/	4,6	All		1.8	Degrees
		to 100 MHz	5			2.5	
Distortion and noise							
2 nd harmonic distortion	HD2	2 V_{PP} at 20 MHz 5/ 6/	4,5,6	All		-40	dBc
		2 V_{PP} at 20 MHz, 5/	4			-40	
		$A_V = -1$	5,6 7/			-40	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ 2/ 3/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 4/ Min	Limits 4/ Max	Unit
Distortion and noise – continued.							
3 rd harmonic distortion	HD3	2 V_{PP} at 20 MHz 5/ 6/	4,6	All		-45	dBc
			5			-40	
		2 V_{PP} at 20 MHz, 5/	4			-40	
		A_V = -1	5 7/			-35	
			6 7/			-40	
Input referred noise voltage	V_N	At 1 MHz to 5/ 6/	4,6	All		5.3	nV/$\sqrt{Hz}$
		200 MHz	5			6	
Input referred noise current	I_{CN}	At 1 MHz to 5/ 6/	4	All		2.6	pA/$\sqrt{Hz}$
		20 MHz	5			2.3	
			6			2.9	
Rise and fall	TRS	0.4 V step, 5/ 6/ C_L < 10 pF, measured between 10% and 90% points	9,11	All		2	ns
			10			3	
	TRL	5 V step, 5/ 6/ C_L < 10 pF, measured between 10% and 90% points	9,10			20	
			11			25	
	TRS	0.4 V step, A_V = -1, 5/ 6/ R_F = 500 Ω, C_L < 10 pF, measured between 10% and 90% points	9,11			5.5	
			10			7.8	
	TRL	5 V step, A_V = -1, 5/ 6/ R_F = 500 Ω, C_L < 10 pF, measured between 10% and 90% points	9			9.5	
			10,11			10	
Settling time	t_S	2 V step at 0.01% of 5/ 6/ the final value, C_L < 10 pF	9,10,11	All		25	ns
		2 V step at 0.1% of 5/ 6/ the final value, C_L < 10 pF				18	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ 2/ 3/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 4/		Unit
					Min	Max	
Time domain response – continued.							
Overshoot	OS	0.4 V step, 5/ 6/	9,10	All		25	%
		C_L < 10 pF,	11			35	
Slew rate	+SR	Rising edge, 5/ 6/	9		750		V/µs
		C_L < 10 pF, measured ±1 V with 5 V step	10,11		600		
		Rising edge, 5/ 6/ A_V = -1, R_F = 500 Ω,	9		500		
		C_L < 10 pF, measured ±1 V with 5 V step	10,11		430		
	-SR	Falling edge, 5/ 6/	9		750		
		C_L < 10 pF, measured ±1 V with 5 V step	10,11		600		
		Falling edge, 5/ 6/ A_V = -1, R_F = 500 Ω,	9		500		
		C_L < 10 pF, measured ±1 V with 5 V step	10,11		430		

1/ Unless otherwise specified, V± = ±5 V dc, A_V = +1, load resistance (R_L) = 100 Ω, tested parameters use R_S = 500 Ω, otherwise, feedback resistance (R_F) = 0 Ω.

2/ Devices supplied to this drawing have been characterized through all levels M, D, P, L, R, F of irradiation. However, this device is only tested at the "F" level. Pre and Post irradiation values are identical unless otherwise specified in table I. When performing post irradiation electrical measurements for any RHA level, T_A = +25°C.

3/ These parts may be dose rate sensitive in a space environment and demonstrate enhanced low dose rate effect. Radiation end point limits for the noted parameters are guaranteed only for the conditions as specified in MIL-STD-883, method 1019, condition A.

4/ The algebraic convention, whereby the most negative value is a minimum and most positive is a maximum, is used in this table. Negative current shall be defined as conventional current flow out of a device terminal.

5/ This parameter is not radiation hardened tested.

6/ If not tested, shall be guaranteed to the limits specified in table I herein.

7/ Group A testing only.

Device types	01 and 02		
Case outlines	P	X	2
Terminal number	Terminal symbol		
1	NC	NC	NC
2	INPUT-	INPUT-	NC
3	INPUT+	NC	NC
4	V-	INPUT+	NC
5	NC	V-	NC
6	OUTPUT	NC	INPUT-
7	V+	OUTPUT	NC
8	NC	NC	INPUT+
9	---	V+	V-
10	---	NC	NC
11	---	---	NC
12	---	---	NC
13	---	---	NC
14	---	---	OUTPUT
15	---	---	NC
16	---	---	V+
17	---	---	NC
18	---	---	NC
19	---	---	NC
20	---	---	NC

NC = No connection

FIGURE 1. Terminal connections.

3.6 Certificate of compliance. For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.6.1 herein). For device class M, a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6.2 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device classes Q and V, the requirements of MIL-PRF-38535 and herein or for device class M, the requirements of MIL-PRF-38535, appendix A and herein.

3.7 Certificate of conformance. A certificate of conformance as required for device classes Q and V in MIL-PRF-38535 or for device class M in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DSCC-VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-PRF-38535, appendix A.

3.9 Verification and review for device class M. For device class M, DSCC, DSCC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 49 (see MIL-PRF-38535, appendix A).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. For device class M, sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. For device classes Q and V, screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection.

4.2.1 Additional criteria for device class M.

a. Burn-in test, method 1015 of MIL-STD-883.

   (1) Test condition B. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.

   (2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in MIL-PRF-38535, appendix B.

TABLE II. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)	Subgroups (in accordance with MIL-PRF-38535, table III)	
	Device class M	Device class Q	Device class V
Interim electrical parameters (see 4.2)	---	---	---
Final electrical parameters (see 4.2)	1,2,3,4 1/	1,2,3,4 1/	1,2,3,4 1/
Group A test requirements (see 4.4)	1,2,3,4,5,6,9,10,11	1,2,3,4,5,6, 9,10,11	1,2,3,4,5,6, 9,10,11
Group C end-point electrical parameters (see 4.4)	1	1	1
Group D end-point electrical parameters (see 4.4)	1	1	1
Group E end-point electrical parameters (see 4.4)	1	1	1

1/ PDA applies to subgroup 1.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-PRF-38535. Inspections to be performed shall be those specified in MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Technology conformance inspection for classes Q and V shall be in accordance with MIL-PRF-38535 including groups A, B, C, D, and E inspections and as specified herein. Quality conformance inspection for device class M shall be in accordance with MIL-PRF-38535, appendix A and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 7 and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table II herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

a. Test condition B. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

b. T_A = +125°C, minimum.

c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table II herein.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels for device classes M, Q and V shall be as specified in MIL-PRF-38535 and the end-point electrical parameters shall be as specified in table II herein.

4.4.4.1 Total dose irradiation testing. Total dose irradiation testing shall be performed in accordance with MIL-STD-883 method 1019, condition A, and as specified herein.

4.4.4.1.1 Accelerated aging testing. Accelerated aging testing shall be performed on all devices requiring a RHA level greater than 5k rads (Si). The post-anneal end-point electrical parameter limits shall be as specified in table I herein and shall be the pre-irradiation end-point electrical parameter limits at 25°C ±5°C. Testing shall be performed at initial qualification and after any design or process changes which may affect the RHA response of the device.

4.4.4.2 Dose rate burnout. When required by the customer, test shall be performed on devices, SEC, or approved test structures at technology qualifications and after any design or process changes which may effect the RHA capability of the process. Dose rate burnout shall be performed in accordance with test method 1023 of MIL-STD-883 and as specified herein.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.1.1 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor prepared specification or drawing.

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users should inform Defense Supply Center Columbus when a system application requires configuration control and which SMD's are applicable to that system. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

6.4 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43216-5000, or telephone (614) 692-0547.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535 and MIL-HDBK-1331.

6.6 Sources of supply.

6.6.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DSCC-VA and have agreed to this drawing.

6.6.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 01-06-14

Approved sources of supply for SMD 5962-91758 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535.

Standard microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-9175801MPA	27014	CLC420AJ-QML
5962-9175801MXA	27014	CLC420AWG-QML
5962-9175801M2A	27014	CLC420AE-QML
5962-9175802MPA	27014	CLC420BJ-QML
5962-9175802M2A	27014	CLC420BE-QML
5962F9175801MPA	27014	CLC420AJFQML
5962F9175801MXA	27014	CLC420AWGFQML

1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed, contact the vendor to determine its availability.

2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE number	Vendor name and address
27014	National Semiconductor 2900 Semiconductor Drive P.O. Box 58090 Santa Clara, CA 95052-8090